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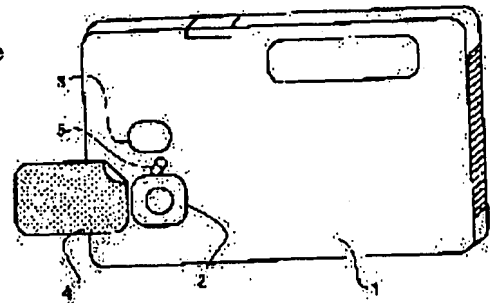
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(54) BARRIER MECHANISM FOR OPTICAL SYSTEM AND IMAGE PICKUP DEVICE EQUIPPED THEREWITH

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a barrier mechanism for an optical member effectively realizing miniaturization and thinning while guaranteeing a proper function, and an image pickup device equipped with the barrier mechanism.

SOLUTION: This barrier mechanism for protecting an optical system has shape with which at least a part of the exposed surface of the optical member is covered in order to protect the optical system 2, and is equipped with a barrier member 4 having an adhesive surface which can be stuck again and peeled and a detection means 5 for detecting that the member 4 is stuck to the vicinity of the optical member. It is also good to provide a 2nd detection means for detecting that the member 4 is stuck to an area other than a range where it covers over the optical member.



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CLAIMS

[Claim(s)]

[Claim 1] The barrier style of the optical system characterized by having the barrier member which is a barrier style for protecting optical system, has the configuration which can cover a part of exposure [at least] of an optical member in order to protect optical system, and has the adhesive face in which re-adhesion and exfoliation are possible, and a detection means for detecting that said barrier member is stuck near said optical member.

[Claim 2] The barrier style of the optical system characterized by establishing the 2nd detection means for detecting that said optical member is stuck on said barrier member by fields other than the wrap range in a barrier style according to claim 1.

[Claim 3] It is the barrier style of the optical system which the electric conduction field which has conductivity in the adhesive face side of said barrier member exists in a barrier style according to claim 1 or 2, and is characterized by constituting said detection means as said electric conduction field and flowing electric contact.

[Claim 4] The barrier style of optical system given in any 1 term of claims 1-3 characterized by being constituted so that an alarm display may be performed when it detects that said barrier member is stuck by said detection means.

[Claim 5] The barrier style of optical system given in any 1 term of claims 1-3 characterized by being constituted so that actuation may be forbidden when it detects that said barrier member is stuck by said detection means.

[Claim 6] The barrier style of the optical system according to claim 2 or 3 characterized by being constituted so that actuation may be permitted, when it detects that forbid actuation when it detects that said barrier member is stuck by said detection means, and said barrier member is stuck by said 2nd detection means.

[Claim 7] Image pick-up equipment characterized by having photography optical system at least, being image pick-up equipment which obtained the image by incorporating the image by which image formation was carried out on the image sensor through this photography optical system, and having the barrier style of a publication in any 1 term of claims 1-6 to said image pick-up optical system.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the barrier style for protecting the optical member in image pick-up equipments, such as a camera.

[0002]

[Description of the Prior Art] Conventionally, as structure of the barrier member which protects an optical member, as shown in drawing 14, the slide lid 12 is attached in the front face of an optical member (taking-lens system of a camera), and at the time of un-using it, the slide lid 12 covers an optical member. Moreover, when using it, the slide lid 12 is made to slide, and an optical member is exposed.

[0003] Or the thin tabular lens guard plate 13 is formed in the front face of an optical member like drawing 15, and the lens guard plate 12 is closed at the time of un-using it. Moreover, when using it, there are some which the lens guard plate 13 opened. Furthermore, when making it not have the above complicated devices, he inserts a cap-like thing in the front face of an optical member, and was trying to protect an optical member.

[0004]

[Problem(s) to be Solved by the Invention] However, in the above conventional examples, a complicated device is required and the structure which especially supports a slide lid etc. is needed. Moreover, the tooth space for driving or containing a lens guard plate is also required, and when a camera is enlarged for these tooth spaces, cost also cannot but start. Since the thickness of a cap is also required, when it is, in addition, going to need and thin-shape-ize structure for holding a cap also by the approach of furthermore capping, there are also many problems.

[0005] This invention aims at offering image pick-up equipment equipped with the barrier style of an optical member and this which realize small, thin shape-ization, etc. effectively, guaranteeing a proper function in view of this actual condition.

[0006]

[Means for Solving the Problem] The barrier style of the optical system of this invention is a barrier style for protecting optical system. In order to protect optical system, it has the configuration which can cover a part of exposure [at least] of an optical member, and it is characterized by having the barrier member which has the adhesive face in which re-adhesion and exfoliation are possible, and a detection means for detecting that said barrier member is stuck near said optical member.

[0007] Moreover, in the barrier style of the optical system of this invention, it is characterized by establishing the 2nd detection means for detecting that said optical member is stuck on said barrier member by fields other than the wrap range.

[0008] Moreover, in the barrier style of the optical system of this invention, the electric conduction field which has conductivity in the adhesive face side of said barrier member exists, and it is characterized by constituting said detection means as said electric conduction field and flowing electric contact.

[0009] Moreover, in the barrier style of the optical system of this invention, when it detects that said barrier member is stuck by said detection means, it is characterized by being constituted so that an alarm display may be performed.

[0010] Moreover, in the barrier style of the optical system of this invention, when it detects that said barrier member is stuck by said detection means, it is characterized by being constituted so that actuation may be forbidden.

[0011] Moreover, in the barrier style of the optical system of this invention, when it detects that said barrier member is stuck by said detection means, actuation is forbidden, and when it detects that said barrier member is stuck by said 2nd detection means, it is characterized by being constituted so that actuation may be permitted.

[0012] Moreover, by incorporating the image by which has photography optical system at least and image formation was carried out on the image sensor through this photography optical system, the photography equipment of this invention is image pick-up equipment which obtained the image, and is characterized by having the barrier style of one of the above to said image pick-up optical system.

[0013] According to this invention, in order to protect optical system, it has the configuration which can cover a part of exposure [at least] of an optical member, and it has the barrier member which has the adhesive face in which re-adhesion and exfoliation are possible. Optical system can be protected effectively, without changing most of the thickness of image pick-up equipments, such as a camera, without this needing a complicated device.

[0014] And according to especially this invention, it is detectable by establishing the detection means for detecting that the barrier member is stuck near the optical member that the barrier member has stuck to image pick-up optical system.

[0015] Moreover, the 1st detection means for detecting that the barrier member is stuck near the optical member protected by sticking a barrier member is established. By having established the 2nd detection means for a barrier member detecting that the optical member is stuck on a barrier member to fields other than the wrap range, it is detectable whether the barrier member is stuck on optical system or it is stuck on parts other than optical system.

[0016] Moreover, the existence of a barrier member is detectable with an easy configuration the electric conduction field which has conductivity existing and using electric contact for the adhesive face side of a barrier member by making this into a detection means. And when stuck on optical system, an alarm display is carried out, or actuation of a camera is forbidden. as for a user, the barrier member is stuck by this -- since it can recognize easily, continuing photography, sticking is lost.

[0017] Furthermore, when it detects that the barrier member is stuck by the 1st detection means, actuation of a camera is forbidden (power source OFF), and actuation of a camera is permitted when it detects that the lens barrier is stuck by the 2nd detection means (power source ON). Thus, with having constituted, since an electric power switch and a barrier member can be made to serve a double purpose, space-saving-ization can be attained.

[0018]

[Embodiment of the Invention] Hereafter, the gestalt of suitable operation of this invention is explained based on a drawing.

(1st operation gestalt) Drawing 1 is drawing showing the 1st operation gestalt of this invention. In drawing, it is a detection means for detecting whether as for finder optical system for photography optical system for 1 to photo a camera and for 2 photo a photographic subject and 3 to observe a photographic subject and 4, the seal-like lens barrier is stuck, and, as for 5, the lens barrier 4 is stuck.

[0019] In the predetermined part of a camera 1, the finder optical system 3 for observing the photography optical system 2 and the photographic subject for photoing a photographic subject is arranged. The easy mimetic diagram of the photography optical system 2 is shown in drawing 3. In this Fig., a photographic subject is in the upper part among drawing, and an image is obtained by incorporating the cover glass 6 for lens protection, and the image by which image formation was carried out on the image sensor 8 through the image formation lens group 7. In the case of this photography optical system 2, the top face of cover glass 6 is the part exposed from the camera 1. Since a photography image will deteriorate if this part becomes dirty or gets damaged, while not taking a photograph, having not exposed as much as possible is desirable.

[0020] Moreover, the easy mimetic diagram of the finder optical system 3 is shown in drawing 4. There is a finder aperture which is opening by the side of a photographic subject in the finder optical system 3 through the interior of a camera from an eye contacting part for a photography person to look into and an eye contacting part. The field which the ocular 9 of an eye contacting part and the finder windowpane 11 both exposed exists. Therefore, it is better for the front face of these members to get damaged, or to be made not to become dirty, in order to obtain a good image, when observing a photographic subject.

[0021] So, while not taking a photograph, such optical system is covered by the lens barrier 4. In the case of the

photography optical system 2, when sticking and photoing the lens barrier 4 on cover glass 6, the lens barrier 4 is used, removing it.

[0022] Here, as shown in drawing 2, as for the lens barrier 4, the rear face as a non-adhesive face is constituted for the front face as an adhesive face. That is, it is usable until it has the structure where the adhesion material which describes paper, a resin film, etc., for example and has the adhesiveness in which multiple times, and pasting and exfoliation are possible in - SU layer was applied, and dust etc. adheres and adhesion becomes weak.

[0023] Although a photographic subject can be looked into through a finder when stuck only on the photography optical system 2 as the lens barrier 4 shows drawing 1, it is in the condition which cannot be photoed. And it is necessary to avoid turning off a shutter as it is. Then, when the lens barrier 4 is stuck on the photography optical system 2, the detection means 5 is arranged in the location by the side of the camera 1 which is covered with coincidence.

[0024] Drawing 5 shows the example of a configuration of this detection means 5. The detection means 5 consists of push button 5a, spring 5b, and contact 5c for detection, as shown in drawing 5. Push button 5a is energized to the upper part among drawing by spring 5b. When the lens barrier 4 is stuck on the photography optical system 2, and the lens barrier 4 presses down like drawing 5, contact 5c for detection is in the non-contact condition. If the lens barrier 4 is removed like drawing 6, push button 5a is pushed up by spring 5b, and contact 5c for detection will be in a contact condition. It is detectable whether the lens barrier 4 is stuck on the photography optical system 2 by this.

[0025] How to notify a user of the information detected with the detection means 5 next is explained. Drawing 7 and drawing 8 show the flow chart of this notice actuation. In addition, the thing of the same number shall achieve the same function. If a power source is turned on in step S2 after a start at step S1, the detection means 5 which shows the condition of the lens barrier 4 in step S3 will be checked. When it is judged that there is no lens barrier 4, the signal with which photography is permitted in step S4 is taken out, and a photograph can be taken.

[0026] When it is judged that there is lens barrier 4 in step S3, it progresses to step S6 and an alarm display is carried out. In the case of drawing 8, release is locked in step S61, and it prevents from photoing it.

[0027] Moreover, the method of using the detection means 5 as an electric power switch besides performing warning or a release lock is also considered. For example, when the lens barrier 4 is stuck, if removed with a power source OFF, it will carry out like a power source ON.

[0028] Furthermore, the example using electric contact as a detection means 5 is shown in drawing 9 and drawing 10. In this example, as shown in drawing 9, a current carrying part is prepared in the adhesive face side of the lens barrier 4, and two electric contact is arranged for the detection means 5 of a camera 1. When the lens barrier 4 is stuck, a contact will be in an energization condition, and if it removes, it will be in a cutting condition. The existence of the lens barrier 4 can be judged by this.

[0029] (2nd operation gestalt) Drawing 11 shows the 2nd operation gestalt of this invention below. In addition, the 2nd operation gestalt is explained to the same member as the 1st operation gestalt using the same sign. Although only one detection means 5 of the lens barrier 4 was established near the photography optical system 2 with the 1st operation gestalt, the 1st detection means 5 and the 2nd detection means 51 are established with this operation gestalt. The 1st detection means 5 is similarly arranged near the photography optical system 2, and it detects that the lens barrier 4 is stuck on the photography optical system 2. In the place distant from the photography optical system 2, the 2nd detection means 51 is arranged in a location which is not worn to the photography optical system 2, when the lens barrier 4 is stuck.

[0030] Usually, if the lens barrier 4 is stuck on an unsuitable location detectable [with the 1st detection means 5] as shown in drawing 12 however when it sticks on the photography optical system 2, it will be said that it is not stuck on the photography optical system 2 being covered somewhat with the detection means 5. Then, the 1st detection means 5 is used in order to detect that the lens barrier 4 is stuck on the image pick-up optical system 2, and the 2nd detection means 51 is formed in the location which removes the lens barrier 4 from the photography optical system 2, and keeps it, and it uses having not started the photography optical system 2 certainly for detecting.

[0031] When it detected with the 1st detection means 5 when there was no lens barrier 4, and there was lens barrier 4 with the 2nd detection means 51 and it detects, it is judged that the lens barrier 4 is not stuck on the

photography optical system 2. When it was not the 1st detection means 5 or 2nd detection means 51, either and detects, since the photography optical system 2 may be covered depending on the case, it judges that it is stuck on the photography optical system 2, and warning is taken out or photography is forbidden.

[0032] How to notify a user of the information detected with the 1st detection means 5 and the 2nd detection means 51 next is explained. Drawing 13 shows the flow chart of this notice actuation. If a power source is turned on in step S2 after a start at step S1, the 1st detection means 5 will be checked in step S3. When it is judged that it progresses step S31 when it is judged that there is no lens barrier 4, an alarm display is spontaneously carried out to step S6.

[0033] The 2nd detection means 51 is checked in step S31, and when it is judged that there is lens barrier 4, the signal with which photography is permitted is taken out and a photograph can be taken. When it is judged that there is nothing, an alarm display is spontaneously carried out to step S6.

[0034]

[Effect of the Invention] according to [as explained above] this invention -- this kind of image pick-up equipment -- setting -- optical system -- receiving -- multiple times -- an optical member can be effectively protected by having an usable barrier member, without changing most thickness of equipment, without needing a complicated device. In this case, by establishing the detection means of a barrier member, it can detect that the barrier member has stuck to image pick-up optical system, and an operation mistake etc. can be lost.

[0035] Moreover, by having established the 2nd detection means, it can detect whether the barrier member is stuck on optical system, or it is stuck on parts other than optical system, and the operation effectiveness of a barrier member can be guaranteed effectively. Furthermore, since a user can recognize the condition of a barrier member easily by carrying out an alarm display and forbidding actuation of a camera when stuck on optical system, photography is not continued sticking and it excels in usability, user-friendliness, etc.

[0036] Furthermore, by OFF/ON [a power source] corresponding to the time of the 1st detection means detecting a barrier member, or the 2nd detection means detecting a barrier member, since an electric power switch and a barrier member can be made to serve a double purpose, it can be useful to space-saving-ization, and control of camera actuation can be ensured.

[Translation done.]

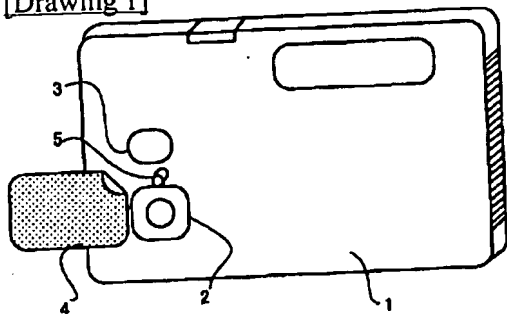
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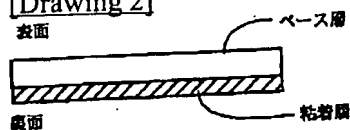
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DRAWINGS

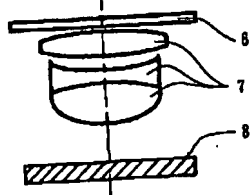
[Drawing 1]



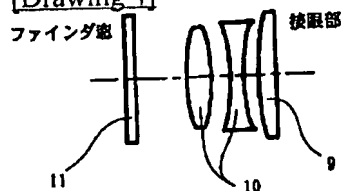
[Drawing 2]



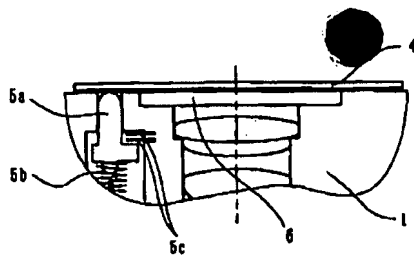
[Drawing 3]



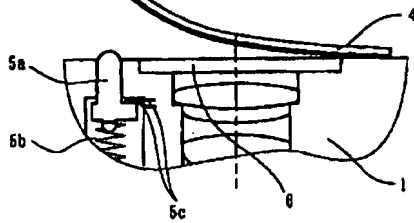
[Drawing 4]



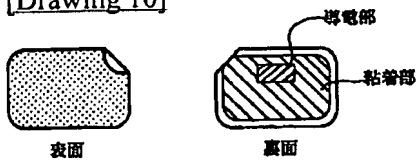
[Drawing 5]



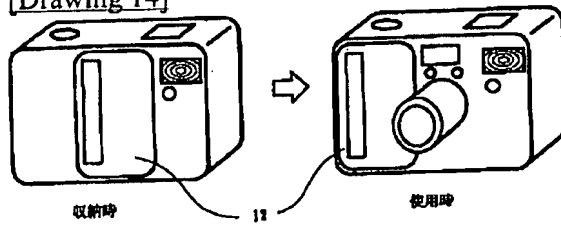
[Drawing 6]



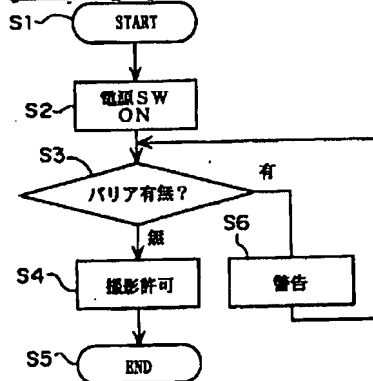
[Drawing 10]



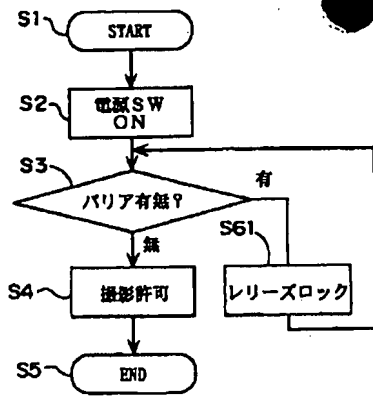
[Drawing 14]



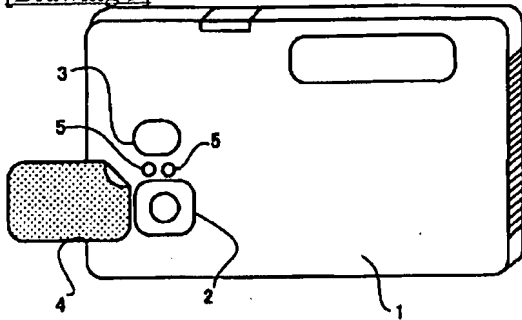
[Drawing 7]



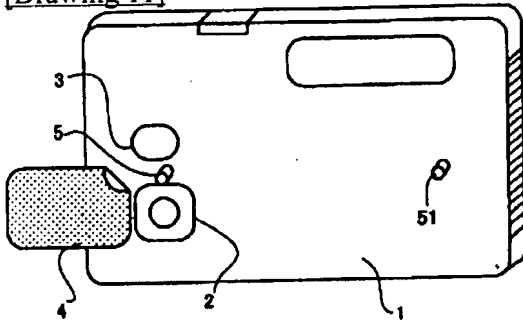
[Drawing 8]



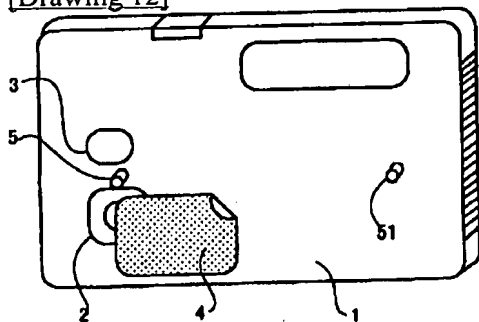
[Drawing 9]



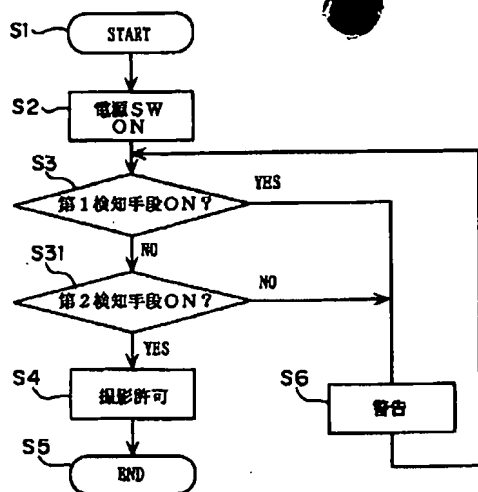
[Drawing 11]



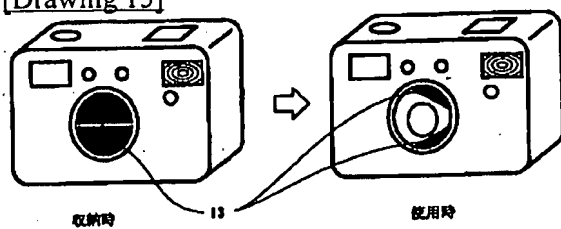
[Drawing 12]



[Drawing 13]



[Drawing 15]



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